_____ (7) Reference materials shall, where possible, be traceable to national or international standards of measurement, or to national or international standard reference materials.

(h) *Calibration and test methods*

_____ (1) The laboratory shall have documented instructions on the use and operation of all relevant equipment, on the handling and preparation of items and for calibration and/or testing, where the absence of such instructions could jeopardize the calibrations or tests. All instructions, standards, manuals and reference data relevant to the work of the laboratory shall be maintained up-to-date and be readily available to the staff.

_____ (2) The laboratory shall use appropriate methods and procedures for all calibrations and tests and related activities within its responsibility (including sampling, handling, transport and storage, preparation of items, estimation of uncertainty of measurement and analysis of calibration and/or test data). They shall be consistent with the accuracy required, and with any standard specifications relevant to the calibrations or tests concerned.

NOTES:

(i) Calibration procedures shall contain the required range and tolerance or uncertainty of each item or unit parameter being calibrated or verified. In addition, the procedures shall contain the generic description of the measurement standards and equipment needed with the required parameter, range, tolerances or uncertainties, and specifications for performing the measurement of the calibration or verification, and/or representative types (manufacturer, model, option) that are capable of meeting the generic description for the measurement standards. The procedures shall be consistent with the accuracy required, and with any standard specifications relevant to the calibrations/verifications concerned.

(ii) The laboratory shall ensure that the calibration uncertainties are sufficiently small so that the adequacy of the measurement is not affected. Well-defined and documented measurement assurance techniques or uncertainty analyses may be used to verify the adequacy of a measurement process. If such techniques are not used, then the collective uncertainty of the measurement standards shall not exceed 25% of the acceptable tolerance (e.g., manufacturer's specification) for each characteristic of the measuring and test equipment being calibrated or verified.

_____ (3) Where methods are not specified, the laboratory shall, wherever possible, select methods that have been published in international or national standards, those published by reputable technical organizations or in relevant scientific texts or journals.

_____ (4) Where it is necessary to employ methods that have not been established as standard, these shall be subject to agreement with the client, be fully documented and validated, and be available to the client and other recipients of the relevant reports [see also (k)(2)(x)].

_____ (5) Where sampling is carried out as part of the test method, the laboratory shall use documented procedures and appropriate statistical techniques to select samples [see also (k)(2)(ix)].

_____ (6) Calculations and data transfers shall be subject to appropriate checks.

(7) Where computers or automated equipment are used for the capture, processing, manipulation, recording, reporting, storage or retrieval of calibration or test data, the laboratory shall have written procedures which ensure that:

_____ (i) the NVLAP requirements are complied with;

_____ (ii) computer software, computers or automated equipment is documented and adequate for use;

_____ (iii) procedures are established and implemented for protecting the integrity of data; such procedures shall include, but not be limited to, integrity of data entry or capture, data storage, data transmission and data processing;

_____ (iv) computer and automated equipment is maintained to ensure proper functioning and provided with the environmental and operating conditions necessary to maintain the integrity of calibration and test data [see also (f)(1)];

_____ (v) it establishes and implements appropriate procedures for the maintenance of security of data including the prevention of unauthorized access to, and the unauthorized amendment of, computer records.

_____ (8) Documented procedures shall exist for the purchase, reception and storage of consumable materials used for the technical operations of the laboratory [see also (m)(2)].

(i) ***Handling of calibration and test items***

_____ (1) The laboratory shall have a documented system for uniquely identifying the items to be calibrated or tested, to ensure that there can be no confusion regarding the identity of such items at any time [see also (k)(2)(v)].

_____ (2) Upon receipt, the condition of the calibration or test item, including any abnormalities or departures from standard condition as prescribed in the relevant calibration or test method, shall be recorded. Where there is any doubt as to the item's suitability for calibration or test, where the item does not conform to the description provided, or where the calibration or test required is not fully specified, the laboratory shall consult the client for further instruction before proceeding. The laboratory shall establish whether the item has received all necessary preparation, or whether the client requires preparation to be undertaken or arranged by the laboratory.

_____ (3) The laboratory shall have documented procedures and appropriate facilities to avoid deterioration or damage to the calibration or test item, during storage, handling, preparation, and calibration or test; any relevant instructions provided with the item shall be followed. Where items have to be stored or conditioned under specific environmental conditions, these conditions shall be maintained, monitored and recorded where necessary. Where a calibration or test item or portion of an item is to be held secure (for example, for reasons of record, safety or value, or to enable check calibrations or tests to be performed later), the laboratory shall have storage and security arrangements that protect the condition and integrity of the secured items or portions concerned [see also (e)].

_____ (4) The laboratory shall have documented procedures for the receipt, retention or safe disposal of calibration or test items, including all provisions necessary to protect the integrity of the laboratory.

_____ (5) Tamper-resistant seals shall be affixed to operator-accessible controls or adjustments on measurement standards or measuring and test equipment which, if moved, will invalidate the calibration. The laboratory's calibration system shall provide instructions for the use of such seals and for the disposition of equipment with damaged or broken seals.

NOTE: Tamper-resistant seals are sometimes affixed to equipment to prevent unauthorized access to areas where adjustments or critical components are located.

(j) *Records*

_____ (1) The laboratory shall maintain a record system to suit its particular circumstances and comply with any applicable regulations. It shall retain on record all original observations, calculations and derived data, calibration records and a copy of the calibration certificate, test certificate or test report for an appropriate period. The records for each calibration and test shall contain sufficient information to permit their repetition. The records shall include the identity of personnel involved in sampling, preparation, calibration or testing [see also (c)(2)(iv)].

▶ **EXCEPTION:** The retention of all original observations, calculations, and
▶ derived data in the calibration record system is not a mandatory requirement
▶ for calibration laboratories, although it is encouraged as good laboratory
▶ practice.

_____ (2) All records (including those listed in (f)(4) pertaining to calibration and test equipment), certificates and reports shall be safely stored, held secure and in confidence to the client [see also (b)(2)(ix), (c)(2)(xviii)].

NOTE: The period of retention shall be specified in the quality manual.

Record retention time specified: _____

(k) *Certificates and reports*

_____ (1) The results of each calibration, test, or series of calibrations or tests carried out by the laboratory shall be reported accurately, clearly, unambiguously and objectively, in accordance with any instructions in the calibration or test methods. The results should normally be reported in a calibration certificate, test report or test certificate and should include all the information necessary for the interpretation of the calibration or test results and all information required by the method used [see also (k)(4)(i)].

▶ **NOTE:** It is recognized that the results of each calibration do not always
▶ result in the production of a calibration certificate or report. Whenever a
▶ certificate or report is produced, the above requirements shall be met.

(2) Each certificate or report shall include at least the following information:

_____ (i) a title, e.g. "Calibration Certificate," "Test Report" or "Test Certificate";

_____ (ii) name and address of laboratory, and location where the calibration or test was carried out if different from the address of the laboratory;

_____ (iii) unique identification of the certificate or report (such as serial number) and of each page, and the total number of pages;

_____ (iv) name and address of client, where appropriate;

_____ (v) description and unambiguous identification of the item calibrated or tested [see also (i)(1)];

_____ (vi) characterization and condition of the calibration or test item;

_____ (vii) date of receipt of calibration or test item and date(s) of performance of calibration or test, where appropriate;

▶ **EXCEPTION:** Although it is encouraged as good laboratory practice, the
▶ requirement for inclusion of the date received is not mandatory for
▶ calibration laboratories.

_____ (viii) identification of the calibration or test method used, or unambiguous description of any non-standard method used;

_____ (ix) reference to sampling procedure, where relevant [see also (h)(5)];

_____ (x) any deviations from, additions to or exclusions from the calibration or test method, and any other information relevant to a specific calibration or test, such as environmental conditions [see also (c)(2)(xv), (h)(4)];

_____ (xi) measurements, examinations and derived results, supported by tables, graphs, sketches and photographs as appropriate, and any failures identified;

_____ (xii) a statement of the estimated uncertainty of the calibration or test result, where relevant;

_____ (xiii) a signature and title, or an equivalent identification of the person(s) accepting responsibility for the content of the certificate or report (however produced), and date of issue [see also (c)(2)(vi)];

_____ (xiv) where relevant, a statement to the effect that the results relate only to the items calibrated or tested;

_____ (xv) a statement that the certificate or report shall not be reproduced except in full, without the written approval of the laboratory;

_____ (xvi) a statement that the report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government;

_____ (xvii) the signature of an approved signatory for all test and calibration reports endorsed with the NVLAP logo;

▶ _____ (xviii) special limitations of use; and

▶ _____ (xix) traceability statement.

_____ (3) Where the certificate or report contains results of calibrations or tests performed by subcontractors, these results shall be clearly identified [see also (l)].

_____ (4) Particular care and attention shall be paid to the arrangement of the certificate or report, especially with regard to presentation of the calibration or test data and ease of assimilation by the reader. The format shall be carefully and specifically designed for each type of calibration or test carried out, but the headings shall be standardized as far as possible [see also (k)(1)].

_____ (5) Material amendments to a calibration certificate, test report or test certificate after issue shall be made only in the form of a further document, or data transfer including the statement "Supplement to Calibration Certificate (or Test Report or Test Certificate), serial number ... (or as otherwise identified)," or equivalent form of wording. Such amendments shall meet all the relevant requirements of item (j).

_____ (6) The laboratory shall notify clients promptly, in writing, of any event such as the identification of defective measuring or test equipment that casts doubt on the validity of results given in any calibration certificate, test report, or test certificate or amendment to a report or certificate.

▸ **NOTE:** Such notification shall quantify the magnitude of error created in the
▸ calibration results. The laboratory shall notify customers promptly, in
▸ writing, of any customer's measuring and test equipment found significantly
▸ out of tolerance during the calibration/verification process. Measurement
▸ data shall be reported so that appropriate action can be taken.

_____ (7) The laboratory shall ensure that, where clients require transmission of calibration or test results by telephone, telex, facsimile or other electronic or electromagnetic means, staff will follow documented procedures that ensure that the NVLAP requirements are met and that confidentiality is preserved.

_____ (8) Whenever a laboratory accredited by NVLAP issues a calibration or test report which contains data covered by the accreditation and also data not covered by the accreditation, it must clearly identify in its records, and in the report to the client, specifically which calibration or test method(s), or portion of a calibration or test method(s), was not covered by the accreditation. The laboratory must also inform the client, before the fact, when calibrations or tests requested are not covered by the accreditation.

NVLAP policy regarding calibration and test reports issued by an accredited laboratory, which reference the laboratory's accredited status, requires that any calibration or test report containing data from calibrations or tests which are not covered by the accreditation include:

_____ (i) a statement at the beginning of the report prominently indicating, "This report contains data which are not covered by the NVLAP accreditation"; and

_____ (ii) a clear indication of which data are not covered by the accreditation.

The laboratory must not misrepresent its accreditation. When a client requires or requests accredited services and any of the requested services are not covered by the accreditation, the client must be so advised.

(l) *Subcontracting of calibration or testing* [see also (k)(3)]

_____ (1) Where a laboratory subcontracts any part of the calibration or testing, this work shall be placed with a laboratory complying with these requirements. The laboratory shall ensure and be able to demonstrate that its subcontractor is competent to perform the activities in question and complies with the same criteria of competence as the laboratory in respect of the work being subcontracted. The laboratory shall advise the client in writing of its intention to subcontract any portion of the testing to another party.

_____ (2) The laboratory shall record and retain details of its investigation of the competence and compliance of its subcontractors and maintain a register of all subcontracting.

_____ (3) A NVLAP-accredited laboratory intending to subcontract testing or calibration work that will be performed and reported as meeting NVLAP procedures and criteria must:

_____ (i) have in its quality manual a subcontracting policy compatible with the NVLAP policy, with a description of the procedures for administering and implementing those actions to demonstrate the conformance and consistency of the subcontracted laboratory to perform according to NVLAP procedures;

_____ (ii) place the subcontracted work with a laboratory that maintains accreditation established by NVLAP shown by a current NVLAP Lab Code, or provide and maintain current records that demonstrate that the subcontracted laboratory is competent to perform the test(s) or calibration(s) and that it operates in a manner consistent with and in conformance to NVLAP criteria for accreditation;

_____ (iii) clearly identify in its records, and in the report to the client, exactly which data were obtained by the NVLAP-accredited laboratory and which data were obtained by the subcontractor, NVLAP-accredited or not;

_____ (iv) inform its client, before the fact, that it intends to subcontract for completion of all or a portion of the client's work; and

_____ (v) include at the beginning of the report the name, address, and contact person of the subcontracted laboratory(ies), and one of the following statements, as appropriate:

if NVLAP-accredited

"This report contains data which were produced by a subcontracted laboratory **ACCREDITED (NVLAP LAB CODE)** for the calibration or test methods performed"

if not NVLAP-accredited

"This report contains data which were produced by a subcontracted laboratory **NOT ACCREDITED** for the calibration or test methods performed."

The requirements of this section do not supersede any regulation, law, contract specification, or other related conditions which require NVLAP accreditation.

(m) ***Outside support services and supplies***

_____ (1) Where the laboratory procures outside services and supplies in support of calibrations or tests, the laboratory shall use only those outside support services and supplies that are of adequate quality to sustain confidence in the laboratory's calibrations or tests.

_____ (2) Where no independent assurance of the quality of outside support services or supplies is available, the laboratory shall have procedures to ensure that purchased equipment, materials and services comply with specified requirements. The laboratory should, wherever possible, ensure that purchased equipment and consumable materials are not used until they have been inspected, calibrated or otherwise verified as complying with any standard specifications relevant to the calibrations or tests concerned [see also (h)(8)].

_____ (3) The laboratory shall maintain records of all suppliers from whom it obtains support services or supplies required for calibrations or tests.

(n) ***Complaints*** [see also (c)(2)(xvii)]

_____ (1) The laboratory shall have documented policy and procedures for the resolution of complaints received from clients or other parties about the laboratory's activities. A record shall be maintained of all complaints and of the actions taken by the laboratory.

_____ (2) Where a complaint, or any other circumstance, raises doubt concerning the laboratory's compliance with the laboratory's policies or procedures, or with the NVLAP requirements or otherwise concerning the quality of the laboratory's calibrations or tests, the laboratory shall ensure that those areas of activity and responsibility involved are promptly audited in accordance with item (c)(3).

(o) ***Measuring and test equipment (M & TE)***

NOTE: This section applies to the control of measuring and test equipment (M & TE) used to assure that supplies and services comply with prescribed customer requirements. It is based in large part on the requirements found in government audit standards such as MIL-STD 45662A, and is found in Part II of the ANSI/NCSL Z540-1-1994 (Draft) standard.

(1) General requirements for M & TE

_____ (i) The supplier shall establish and document a system to control the calibration/verification of M & TE.

_____ (ii) M & TE used to determine compliance with customer technical specifications shall be calibrated or verified in accordance with sections 285.33(b) through (n).

_____ (iii) The supplier shall have a program to recall for calibration or verification, or remove from service, M & TE that has exceeded its calibration interval, has broken calibration seals, or is suspected to be malfunctioning because of mishandling, misuse, or unusual results.

_____ (iv) All operations performed by the supplier in compliance with these requirements shall be subject to customer verification at unscheduled intervals.

_____ (v) The supplier shall carry out, or arrange to have carried out, periodic quality auditing of the calibration and verification system in order to ensure its continuing effective implementation and compliance with these requirements.

- Based on the results of the audits and any other relevant factors, such as customer feedback, the supplier shall review and modify the system as necessary.

- Plans and procedures for the audits shall be documented. The conduct of the audit and any subsequent corrective action shall also be documented.

(2) Detailed requirements for M & TE

_____ (i) Calibration system description: The supplier shall provide and maintain a written description of the calibration/verification system covering M & TE and measurement standards. The description shall be sufficient to satisfy each requirement of section 285.33(o) and any deviations shall be submitted with supporting documentation to the customer for approval.

_____ (ii) Adequacy of measurement standards: Measurement standards used by the supplier for calibrating M & TE and other measurement standards shall comply with the requirements of items (f)(1), (g)(1), and (h)(2).

_____ (iii) Environmental conditions: M & TE shall be used in an environment controlled to the extent necessary to ensure valid results. Due consideration shall be given to temperature, humidity, lighting, vibration, dust control, cleanliness, electromagnetic interference and any other factors affecting the results of measurements. Where pertinent, these factors shall be monitored and recorded and, when appropriate, correcting compensations shall be applied to measurement results.

_____ (iv) Intervals of calibration and verification: M & TE requiring calibration shall be calibrated or verified at periodic intervals established and maintained to assure acceptable reliability, where reliability is defined as the probability that M & TE will remain in-tolerance throughout the interval. Intervals shall be established for all M & TE requiring calibration unless the equipment is regularly monitored through the use of check standards in a documented measurement assurance process. Check standards must closely represent the item parameters normally tested in the process and the check standard must be verified periodically. Where intervals are used to ensure reliability, the interval setting system must be systematically applied and shall have stated reliability goals and a method of verifying that the goals are being attained. Intervals may be based on usage or time since last calibration or verification. All exemptions from periodic calibration or verification shall be documented. The recall system may provide for the temporary extension of the calibration due date for limited periods of time under specified conditions that do not unreasonably impair the satisfaction of the customer's requirements.

_____ (v) Calibration procedures: Procedures used to calibrate/verify the supplier's M & TE shall comply with the requirements of items (h)(1) and (h)(2).

_____ (vi) Out-of-tolerance conditions: If any M & TE is found to be significantly out of tolerance during the calibration/verification process, the supplier's system shall provide for notification to the user and to the supplier's quality element, if appropriate, of the out-of-tolerance condition with the associated measurement data so that appropriate action can be taken.

_____ (vii) Adequacy of calibration system: The supplier shall establish and maintain documented procedures to evaluate the adequacy of the calibration system and to ensure compliance with these requirements.

_____ (viii) Calibration sources: M & TE requiring calibration shall be calibrated or verified by laboratories that comply with sections 285.33(b) through (n).

_____ (ix) Records: These requirements shall be supported by records documenting that established schedules and procedures are followed to maintain the adequacy of all M & TE. The records for M & TE requiring calibration shall include an individual record of calibration or verification, or other means of control, providing a description or identification of the item, calibration interval, date calibrated, identification of the calibration source, calibration results (data and/or condition status) and calibration action taken (adjusted, repaired, new value assigned, derated, etc.).

_____ (x) Calibration status: M & TE shall be labeled to indicate calibration or verification status. The label shall identify specific date calibrated (day, month, year, Julian date, or equivalent) and the specific calibration due date or usage equivalent. Items not calibrated to their full capability or which have other limitations of use, shall be labeled or otherwise identified as to the limitations. When it is impractical to apply a label directly to an item, the label may be affixed to the instrument container or some other suitable means may be used to reflect calibration status. Tamper-resistant seals are affixed to operator accessible controls or adjustments which if moved will invalidate the calibration. The quality system shall provide instructions for the disposition of equipment with broken tamper-resistant seals.

_____ (xi) Control of subcontractor calibration: The supplier is responsible for assuring that the subcontractor's calibration system conforms to section 285.33 (l) to the degree necessary to assure compliance with contractual requirements. NVLAP accreditation of the subcontractor's laboratory can serve as the basis for compliance with this requirement.

_____ (xii) Storage and handling: M & TE shall be handled, stored, and transported in a manner which shall not adversely affect the calibration or condition of the equipment.

GENERAL OPERATIONS CHECKLIST - COMMENTS AND DEFICIENCIES

Instructions to the Assessor: Use this sheet to document comments and deficiencies. For each, identify the appropriate item number from the checklist. Identify comments with a "C" and deficiencies with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

Item No.	*Comments and/or Deficiencies*

NVLAP LAB CODE:

GENERAL OPERATIONS CHECKLIST - COMMENTS AND DEFICIENCIES

Instructions to the Assessor: Use this sheet to document comments and deficiencies. For each, identify the appropriate item number from the checklist. Identify comments with a "C" and deficiencies with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

Item No.	*Comments and/or Deficiencies*

ET 95-19

NVLAP LAB CODE: [redacted]

National Voluntary Laboratory Accreditation Program (NVLAP)
for
Electromagnetic Compatibility and Telecommunications Testing

ON-SITE CHECKLIST FOR FCC PART 15 - DIGITAL DEVICES

This checklist is designed for use by a NVLAP Technical Expert(s) (TE) during the conduct of an on-site assessment for initial or renewal of accreditation. The checklist contains items from the NVLAP Program Handbook(s), 7 CFR Part 285 - NVLAP Procedures, 47 CFR - Telecommunications - Part 15, ANSI C63.4, CISPR 22 and other technical references. This checklist will be used in conjunction with other NVLAP checklists.

The completed checklist becomes a part of the laboratory ON-SITE ASSESSMENT REPORT which is used in the evaluation of the laboratory for granting or renewal of accreditation. Deficiencies noted in this checklist must be resolved in accordance with the NVLAP Procedures. Comments not specified as deficiencies may be directed to the laboratory by the TE.

Laboratory Name _____

NVLAP Technical Expert(s) _____

On-Site Dates _____

Facility and Test Site(s) Assessed _____

_____

Instructions to Laboratory

Respond in writing within 30 days of the date of this report, addressing all deficiencies documented by the assessor. Each deficiency must be referenced, in your response, by number as it is listed in the report.

This on-site assessment report conveys the opinion of the assessor as a single representative of NVLAP. The final evaluation of your laboratory for the purpose of recommending approval or denial of accreditation will be conducted by NIST evaluators who will review this report, the written information submitted by you, and results of any required proficiency testing. You must respond to this report by identifying the actions you have taken, or plan to take, to correct the deficiencies identified. Respond in detail so that an accurate evaluation can be completed. Failure to respond may delay an accreditation decision. Questions concerning this report should be directed to NVLAP.

The assessor has discussed the contents of this report with members of the laboratory management who agree to respond in writing to NIST, regarding resolution or correction of any deficiencies noted, within 30 days of the date of this report.

_____

Signature of Authorized Representative or designee | Printed Name | Date

National Voluntary Laboratory Accreditation Program (NVLAP)
for
Electromagnetic Compatibility and Telecommunications Testing

ON-SITE CHECKLIST FOR FCC PART 15 - DIGITAL DEVICES

Summary of the NVLAP requirements for FCC Part 15 testing:

_____ The laboratory must meet all NVLAP general criteria as stated in NIST Handbook 150.

_____ The laboratory must meet all NVLAP technical criteria as stated in the program specific handbook.

_____ Laboratories shall keep at their facility appropriate, up-to-date files as part of their documentation system. The files must be covered by the laboratory quality system.

_____ The files shall be available for review by the NVLAP on-site assessor(s) during regular on-site or monitoring visits.

_____ Each radiated and line conducted emissions test site (including open area, anechoic chambers, and weather protected sites) that is used for FCC equipment authorization testing shall meet the FCC Facility Listing requirements.

_____ Testing for FCC registration must be conducted using ANSI C63.4 or other FCC approved standard.

_____ Antennas must be calibrated per ANSI C63.4 section 4.4.1 and ANSI C63.5. "Traceability is the property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM 1993)

National Voluntary Laboratory Accreditation Program (NVLAP)
for
Electromagnetic Compatibility and Telecommunications Testing

ON-SITE CHECKLIST FOR FCC PART 15 - DIGITAL DEVICES

Instructions to the Assessor: This checklist addresses specific criteria relating to FCC facility listing requirements.

Place an "X" beside any of the following items which represent a NVLAP deficiency. Place a "C" beside each item on which you are commenting for other reasons. Record the item number and your written deficiency explanations and/or comments in this list or on the comment sheet(s).

Place a check beside all other items you observed or verified at the laboratory. All items must be marked.

I. MEASUREMENT INSTRUMENTATION

A. Line Impedance Stabilization Network (LISN).

_____ 1. Is a 50 ohm, 50 microhenry LISN used?

_____ A 5 microhenry LISN is NOT allowed to be used.

_____ 2. Does LISN have a calibration sticker on it?

_____ 3. Has LISN impedance and insertion loss been calibrated within the last year?

_____ 4. Is the Impedance of the LISN measured at the AC receptacle socket with 50 ohm termination on the instrumentation monitoring port? The tolerance is +30% and -20% of nominal Impedance shown in Figure 1.

_____ 5. Is the insertion loss greater than 0.5 dB?

_____ 6. Is a correction factor used when measuring Conducted emissions? If so, then why? Is it because the LISN insertion loss is greater than 0.5 dB?

B. Antennas in Frequency Range from 30 MHz to 40 GHz.

_____ 1. Are all the Antennas used for Final Compliance Testing Calibrated?

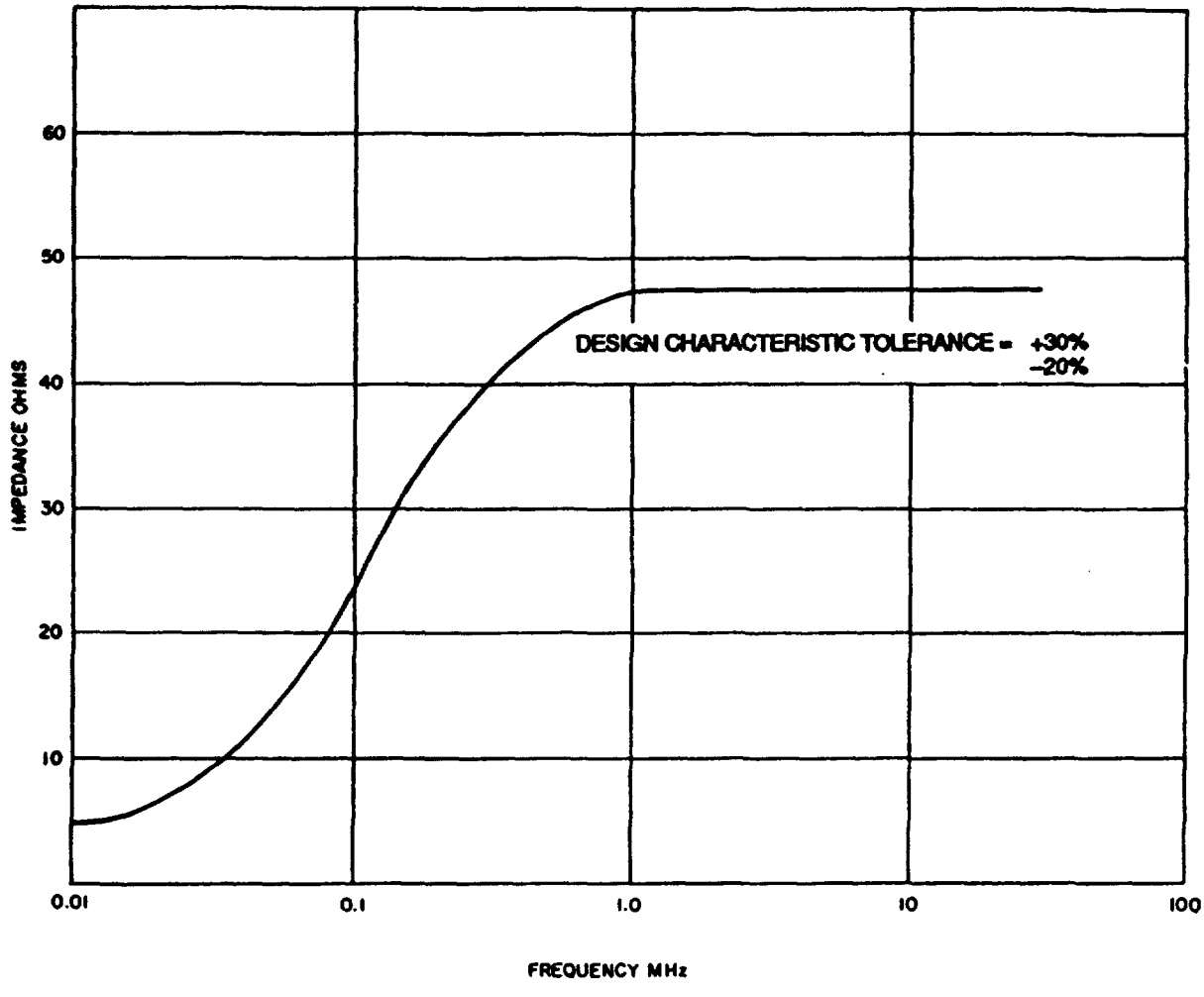

Figure 1. Impedance Characteristic of LISN at EUT Port
10 kHz to 30 MHz

_____ 2. Are these Antennas linearly polarized?

_____ 3. Are Tuned Dipoles used in the Frequency Range from 30 to 1000 MHz?

_____ 4. Are Broadband Antennas used for Final Compliance measurements?

_____ 5. Are Standard Gain Horns used in the Frequency Range from 1 to 40 GHz?

_____ 6. Are Antennas Calibrated at least once a year?

_____ 7. Do all Antennas used for Final Compliance have Calibration Stickers on them?

C. Measurement Receiver or Spectrum Analyzer.

_____ 1. Is the measuring Receiver or Spectrum Analyzer Calibrated?

_____ 2. Has unit been Calibrated within the last Year?

_____ 3. Is Peak Detector Function available?

_____ 4. Is Average Detector Function available?

_____ 5. Is Quasi-Peak Detector Function available?

_____ 6. Is any Video Filtering or Post Detector Filtering used? If so, then bandwidth must be wide enough so an not to affect the Peak detector readings.

_____ 7. Is the Minimum Bandwidth for frequency range from 9 kHz to 150 kHz; 100 Hz?

_____ 8. Is the Minimum Bandwidth for frequency range from 150 kHz to 30 MHz; 9 kHz?

_____ 9. Is the Minimum Bandwidth for frequency range from 30 MHz to 1000 MHz ; 100 kHz?

_____ 10. Is the Minimum Bandwidth for frequency range from 1 GHz to 40 GHz; 1 MHz?

_____ 11. Does the measuring instrumentation using any of the three detector functions have a linear response?

II.TEST FACILITIES

A. Test Setup & Facilities for Measuring Conducted Emissions.

_____ 1. Is the Powerline Conducted Ambient at least 6 dB below the limit?

_____ 2. Are Powerline Filters used between the LISN and the incoming Power Source?

_____ 3. Are Conducted emission measurements being made in a shielded enclosure?

_____ 4. Are Conducted emission measurements monitored by a loudspeaker or headphones?

_____ 5. Are Conducted emission measurements observed by a video display using a time-based oscilloscope?

_____ 6. Is the Ground Plane for measuring Conducted emissions a minimum of 2 X 2 meters in size?

_____ 7. Is the Ground Plane part of a Shielded Chamber?

_____ 8. For a Floor Standing EUT, does the Horizontal Ground Plane extend 0.5 meters beyond the vertical projection (footprint) of the EUT?

_____ 9. Is the Horizontal Ground Plane covered with an insulating material of 3 to 12 mm in thickness?

_____ 10. For a Table Top EUT, does the Vertical Ground Plane have a minimum size of 2 X 2 meters and located 40 cm to the rear of the EUT?

_____ 11. Is the Horizontal and Vertical Ground Planes connected at intervals not greater than 1 meter along its entire length through low impedance connections of not less than 3 cm wide metal straps?

For measuring Conducted Emissions on an Open Area Test Site for Table Top EUT and Floor Standing EUT please refer to Section 5.2.2 for acceptable criteria.

_____ 12. Is the LISN grounded to the Ground Plane?

_____ 13. How is the LISN grounded to the Ground Plane? ___Metal Straps? ___Braid Straps? _____Other?

_____ 14. Is the Test Platform for a Table Top EUT 1 X 1.5 meters in size and raised 80 cm above the ground plane?

_____ 15. Are the I/O connecting cables always at least 40 cm above the ground plane?

_____ 16. If a monitor can be powered through an outlet on the host unit, then is conducted emission testing performed with the monitor powered through the host and with the monitor powered separately?

_____ 17. Are AC power cords that are used for Conducted emission testing of the same electrical and shielding characteristics that are shipped with the EUT?

_____ 18. Are all surfaces of Floor Standing and Table Top EUTs at least 80 cm from any other grounded surface, including all LISNs? (The exception is the 40 cm distance from the rear of the EUT to the Vertical Ground Plane).

_____ 19. Are adapters between the EUT power cord plug and the LISN power socket less than 20 cm long and contain only 1 plug and 1 receptacle?

_____ 20. Is the LISN Safely grounded?

_____ 21. Is the excess power cord length between the EUT and the LISN folded back and forth in a bundle, located in the center of the power cord, not to exceed 40 cm?

_____ If non-flexible power leads are used, please refer to Section 7.2.1 for acceptable criteria.

_____ 22. It the conducted emission test setup in accordance with Figure 2 for a Table Top EUT and Figure 3 for a Floor Standing EUT?

_____ 23. Is the measurement frequency range used for measuring conducted emissions 450 kHz to 30 MHz?

_____ 24. Are all measuring ports of the LISN terminated in 50 ohms?

_____ 25. Is the EUT connected to one LISN and all the peripherals connected to a second LISN?

_____ 26. Based on preliminary tests, does this conducted emission compliance test represent the maximized cable configuration and worse case mode of EUT operation yielding the highest levels?